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## WORK PLAN

for the  
Investigation of the Unsaturated Zone  
at the  
Former Huffy Facility  
in Azusa, California  
for Perchlorate, 1,4-Dioxane, and NDMA

Prepared by:



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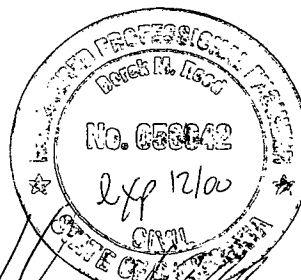
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Submitted to:

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A handwritten signature in dark ink, appearing to read "Peter T. Quinlan".  
\_\_\_\_\_  
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14 February 2000

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GROUNDWATER MONITORING WELL; VAPOR WELLS, BORING AND TRENCH LOCATIONS

### INTERIM SITE INVESTIGATION REPORT

1120 W. Foothill Boulevard • Azusa, California

April 1993 – Project No. 046250380

## 1.0 INTRODUCTION

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The Los Angeles Regional Water Quality Control Board ("Regional Board") issued Cleanup and Abatement Order No. 99-118 ("the Order") to Huffey Corporation ("Huffey") regarding the former Huffey bicycle manufacturing facility at 1120 West Foothill Boulevard, Azusa, California ("the Site") on 1 December 1999. The Order directed Huffey to prepare a work plan to assess the presence of perchlorate, 1,4-dioxane and N-nitrosodimethylamine (NDMA) (together the "emerging chemicals") in the unsaturated zone at the Site.

Huffey has filed a petition for review of the Order with respect to the directive requiring sampling for the emerging chemicals. The Regional Board has tentatively scheduled a hearing on the Order for April 13, 2000. Dudek & Associates submits this work plan without prejudice to Huffey's petition for review.

In 1999, Huffey conducted sampling events that assessed the presence of the emerging chemicals in the groundwater (Regional Board Report, 1999). These sampling events failed to detect either 1,4-dioxane or NDMA. Concurrent sampling events detected the presence of these chemicals at other sites in the San Gabriel Valley. 1,4-dioxane was found in the groundwater beneath sites belonging to Aerojet General Corporation ("Aerojet"), Azusa Land Reclamation ("ALR") and Oil & Solvent Process Company ("OSCO"). NDMA was detected in the groundwater under the Aerojet site.

Perchlorate was detected in the Huffey monitoring well at concentrations of 7.6 ug/l and 8.2/7.9 ug/l during the 1999 sampling events. However, perchlorate is a chemical used in the manufacture of explosives, flares, pyrotechnics and solid rocket propellants. There is no evidence that Huffey used perchlorate during its occupancy of the site; Huffey manufactured bicycles at the Site and did not engage in any of the activities associated

with the perchlorate use. It has been determined that perchlorate was disposed of in the Kincaid Pit located northwest (and occasionally upgradient) of the Site (Letter from the Baldwin Park Operable Unit Steering Committee to the United States Environmental Protection Agency (EPA), 13 May 1998). Perchlorate has also been detected in the groundwater beneath the Aerojet site, south and west of the Site.

## **2.0 PROPOSED SAMPLING**

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### **2.1 Proposed Sampling Locations**

Three soil samples for the analysis of the emerging chemicals will be collected in the former drum storage areas (Figure 1, Table 1). One sample each will be collected in the former paint strip area and in the former paint spray booth area. A sixth soil sample will be collected in the approximate location of the former clarifier. A seventh soil sample will be collected in the former manufacturing area.

### **2.2 Proposed Sampling Methodology**

#### *2.2.1 Soil Sample Collection*

Previous attempts to sample soil at the Site with hollow stem augers were unsuccessful because of inadequate sample recovery in split spoon samplers due to the abundance of gravels, cobbles, and boulders in the shallow soil (See Attachment A, Ogden, *Interim Site Investigation Report*, 1993). Ogden resorted to excavating trenches with a backhoe and sampling the sidewalls of the trenches. Trenches were excavated to approximately 5 feet below land surface (BLS). Samples were collected at depths of 1.7 to 4.4 feet BLS.

The proposed samples will be collected from trenches at depths of approximately 3 feet BLS. Soil samples will be collected from the backhoe bucket using a trowel and placed in jars. Dedicated trowels will be used for each sample location. After sampling, trowels will be washed with Alkanox soap prior to disposal. Table 2 specifies sample containers and preservation for each type of analysis.

NDMA has a vapor pressure of 2.7 mm mercury at 20 C indicating that it is not particularly volatile (Table 3). No vapor pressure was available for perchlorate, but it is a solid at normal temperatures. 1,4-Dioxane has a vapor pressure of 30 mm of mercury at 20°C compared to a vapor pressure of 60 mm mercury at 20 C for TCE. Thus it is less volatile than TCE. Additionally it is miscible in water, not even volatilizing from water when treated with air strippers. If 1,4-dioxane is present in soil moisture, it will not be lost with this sampling method. The octanol water equilibrium constants for TCE and 1,4-dioxane indicate that TCE is probably more likely to sorb to organic matter in soil than 1,4-dioxane.

#### *2.2.2 Analytical Methods*

1,4-Dioxane analyses will be performed according to EPA Method 8270 with a detection limit of 20 micrograms per kilogram (ug/kg) (Table 2). Sample containers, preservation and holding times are also specified in Table 2. 1,4-Dioxane analyses will be performed by West Coast Analytical Service, Inc. in Santa Fe Springs, California.

NDMA analyses will be performed according to USAEC/DCL SOP UM-34 with a detection limit of 0.7 µg/kg (Table 2). Sample containers, preservation and holding times are also specified in Table 2. NDMA analyses will be performed by DataChem Laboratories in Salt Lake City, Utah.

Perchlorate analyses will be performed according to EPA Method 300.0 with a detection limit of 4 µg /kg (Table 2). Sample containers, preservation and holding times are also specified in Table 2. Perchlorate analyses will be performed by West Coast Analytical Service, Inc. in Santa Fe Springs, California.

### **3.0 EXCAVATED SOIL HANDLING**

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Excavated soil will be stockpiled on plastic sheeting during excavation and replaced and compacted in the trenches. After the trenches are refilled, the asphalt will be repaired.

### **4.0 SCHEDULE**

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The investigation will begin within four weeks of RWQCB approval of the Work Plan. A site Health and Safety Plan will be prepared after work plan approval and prior to field work.

TABLE 1.  
PROPOSED SOIL SAMPLING LOCATIONS

Sample ID	Location	Analytes
HSS-1	Western Drum Storage Area	1,4-Dioxane, NDMA, Perchlorate
HSS-2	Eastern Drum Storage Area	1,4-Dioxane, NDMA, Perchlorate
HSS-3	Southern Drum Storage Area	1,4-Dioxane, NDMA, Perchlorate
HSS-4	Paint Spray Booth	1,4-Dioxane, NDMA, Perchlorate
HSS-5	Paint Stripping Area	1,4-Dioxane, NDMA, Perchlorate
HSS-6	Manufacturing Area	1,4-Dioxane, NDMA, Perchlorate
HSS-7	Clarifier	1,4-Dioxane, NDMA, Perchlorate



**TABLE 2.**  
**ANALYTICAL METHODS AND HANDLING**

Chemical	Laboratory Conducting Analysis	Maximum Holding Time Prior to Laboratory Analysis	Sample Preservati on	Sample Collection Containers	Desired Sample Mass for Analysis	EPA Analysis Method	Detection Limit
n-Nitrosdimethylamine (NDMA)	DataChem Laboratories, Inc.	14 DAYS	4 °C	8 oz. Amber glass jars	40 grams	USAEC/ DCL SOP UM-34	0.7 ug/kg
Perchlorate	WEST COAST ANALYTICAL	72 HOURS	4 °C	8 oz. Amber glass jars	50 grams	300.0	4 ug/kg
1,4-Dioxane	WEST COAST ANALYTICAL	14 DAYS	4 °C	8 oz. Amber glass jars	50 grams	8270	20 ug/kg

**TABLE 3.**  
**CHEMICAL PROPERTIES**

	1,4-Dioxane	n-Nitrosdimethylamine (NDMA)	TCE
<b>Boiling Point (°C at 750 mm Hg)</b>	101	154	87.2
<b>Henry's Law Constant (atm*m<sup>3</sup>/mol at 25°C)</b>	4.88x10 <sup>-6</sup>	0.143	0.0091
<b>K<sub>oc</sub></b>	3.5	25.7	64.6
<b>Melting Point (°C)</b>	11.8	No data found	-73
<b>Solubility in water</b>	miscible	completely miscible	1100 mg/l at 20 °C
<b>specific density (at 20/4 °C)*</b>	1.0337	1.0059	1.4642
<b>Vapor Pressure (mm Hg at 20 °C)</b>	30	2.7	57.8

\* values represent the specific density of a substance at 20 oC with respect to water at 4 oC

Data obtained from:

Groundwater Chemicals Desk Reference, 1991 and Groundwater Chemicals Desk Reference, Vol. 2, 1991

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## **ATTACHMENT A**

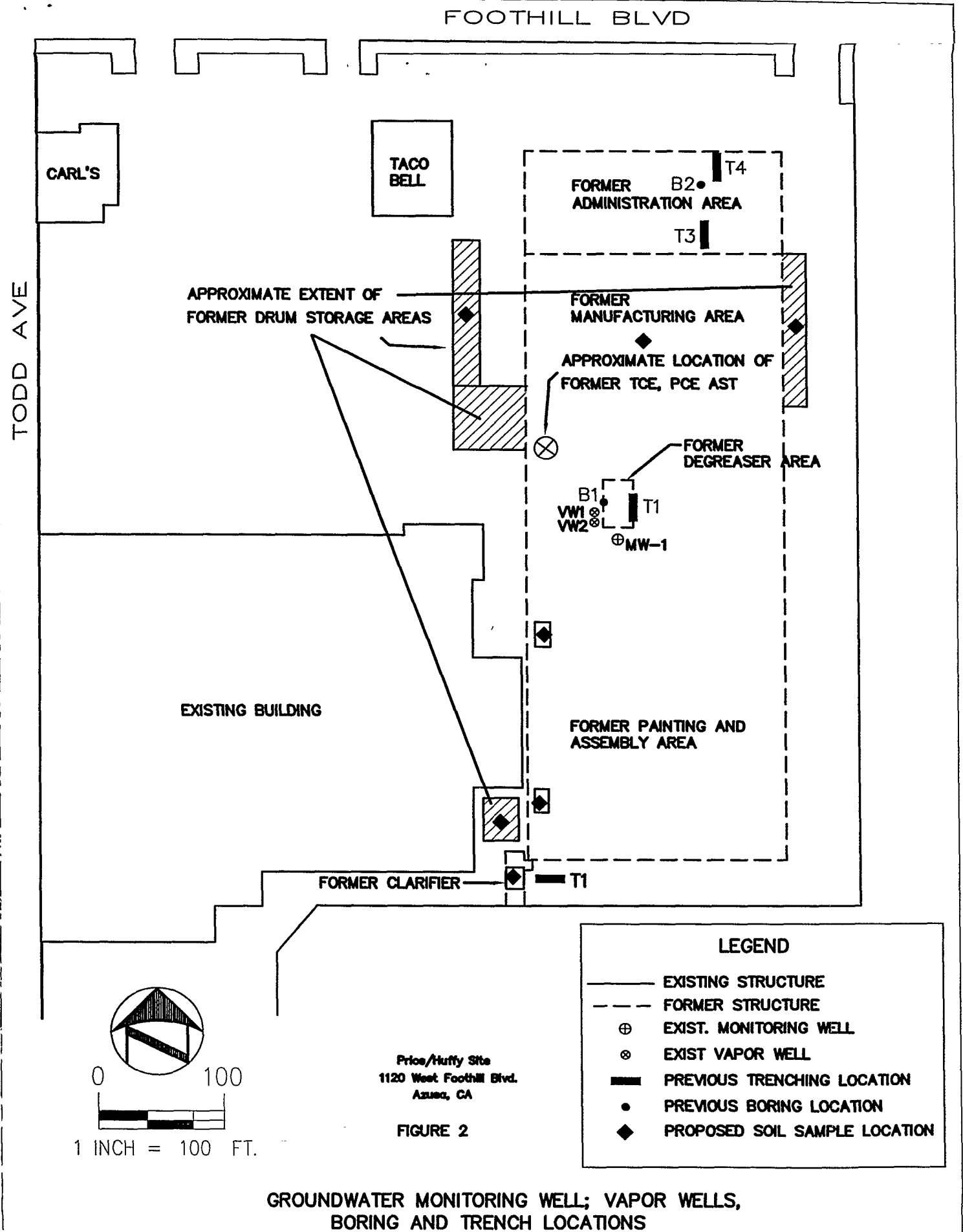
### **Figure 2**

**GROUNDWATER MONITORING WELL; VAPOR WELLS, BORING AND TRENCH LOCATIONS**

### **INTERIM SITE INVESTIGATION REPORT**

**1120 W. Foothill Boulevard • Azusa, California**

**April 1993 – Project No. 046250380**



**Interim Site Investigation Report  
1120 W. Foothill Boulevard  
Azusa, California**

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April 1993  
Project No. 046250380



## SECTION 5

### SOIL SAMPLING

Following the soil gas survey, soil borings and trenching were conducted at the project site. Methodologies for soil borings are described in Appendix E and methodologies for trenching are presented in Appendix G. Rationale and results for both activities are discussed in the following paragraphs.

#### 5.1 SOIL BORINGS

##### 5.1.1 Rationale

A total of three borings were drilled on March 12, 1993. Soil borings were initiated to further assess the results found at specific soil gas survey points and to screen for contaminants that would not be detected in a soil gas survey, such as heavy-end hydrocarbons. Soil borings were conducted at the highest soil gas points and in areas where hazardous substances were historically handled. Although Ogden had planned to conduct five soil borings at the site, due to the cobbly nature of the site soils, only three soil borings could be conducted. A site map showing the soil boring locations is presented as Figure 5-1.

##### 5.1.2 RESULTS AND DISCUSSION

A total of four soil samples were collected during the conduct of three borings. Three of the samples were collected from Boring 1 (B1) and were submitted to Associated Lab for analysis. The fourth sample was collected from Boring 2 (B2) and submitted to Associated Labs for disposal, but was not analyzed as not enough soil could be recovered. No samples were collected from Boring 3 (B3), as not enough soil could be recovered for analysis. Results of these analyses are shown in Table 5-1. Original laboratory reports are included as Appendix F of this report.

The 3 samples from B1 were collected at depths of 2.5 feet, 6 feet, and 10 feet and were analyzed for halogenated volatile organics by EPA Method 8010. The only analyte detected was PCE at a concentration of 0.1 mg/kg in sample PC-B1-S1, collected from a depth of 2.5 feet. All three samples were also analyzed for aromatic volatile organics by EPA Method 8020. No detectable levels of aromatic volatile organics were present in these

samples. The three samples were also analyzed for hydrocarbons by EPA Method 418.1 (modified). Hydrocarbons were only detected in one same sample. Sample PC-B1-S1 contained TPH at 94 mg/kg. Sample PC-B1-S1 is the same sample in which PCE was identified.

## 5.2 TRENCHING

### 5.2.1 Rationale

Trenching operations were initiated to further assess the results found at specific soil gas points that could not be adequately sampled by soil borings. Trenching was chosen as the appropriate method of investigation because the cobbly nature of the soil does not lend itself to drilling. In addition, the subsurface is exposed during excavation of a trench, allowing visual observation of subsurface characteristics. It also enables a relatively large area to be assessed, thus decreasing the likelihood of missing the presence of subsurface contamination indicated by the soil gas survey results. Trenches were conducted at the highest soil gas points and in areas where hazardous materials were historically handled. Figure 5-1 depicts trench locations at the site.

### 5.2.2 Results And Discussion

Seven samples from four trenches were collected and analyzed during this phase of the investigation. Trench samples were analyzed for chlorinated solvents by EPA Method 8010 and for TPH by EPA Method 418.1 (modified). Results of these analyses are shown on Table 5-1. Original laboratory reports are included as Appendix H.

PCE was evident in two of the seven soil samples. Sample T1-D3 collected from Trench 1 (T1) at a depth of 3 feet showed a concentration of 0.009 mg/kg and sample T2-D1.7 collected from Trench 2 (T2) at a depth of 1.7 feet showed a concentration of 0.085 mg/kg. In addition, sample T2-D4.4, also collected from Trench 2, but at a depth of 4.4 feet showed a concentration of 0.008 mg/kg of TCE. Hydrocarbons were not present in any of the seven samples collected from the four trenches. Samples collected from Trench 3 (T3) and Trench 4 (T4) did not exhibit detectable traces of chlorinated solvents or hydrocarbons.